

In asthma patients: relationship between symptom control, quality of life, and the beck anxiety scale

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ABSTRACT

Aims: Asthma is a chronic disease characterized by recurrent airway obstruction. It affects the quality of life of patients and can lead to anxiety and other psychological disorders. In this study, we aimed to find out how asthma affects patients' quality of life and psychological state by using the SF-36 quality of life scale and the Beck anxiety scale (BAS) in patients diagnosed with asthma.

Methods: 222 patients diagnosed with asthma in our outpatient clinics were included in the study. Patient demographic characteristics and respiratory function test parameters were recorded. Outcomes were determined by assessing asthma control status with the asthma control test (ACT), patients' emotional state with the BAS, and quality of life with the SF-36.

Results: According to ACT, 37.8% of patients were uncontrolled, 33.8% were partially controlled, and controlled 28.4%. The distribution in terms of asthma classification: 29.8% were mild intermittent, 5% mild persistent, 35.1% moderate persistent and 40.1% severe persistent. When comparing between ACT groups in relation to the SF-36 quality of life scale; physical function ($p<0.001$), physical role difficulties ($p<0.001$), emotional role difficulties ($p<0.001$), vitality ($p<0.001$), mental health ($p<0.001$), social function ($p<0.001$), pain ($p<0.001$), and general health ($p<0.001$). There was a difference between the groups ACT in relation to BAS ($p<0.001$).

Conclusion: We believe that when regulating the medical treatment of asthma patients, not only their respiratory functions but also their quality of life and psychological status should be evaluated, and measures should be taken to improve the quality of life and psychological disorders.

Keywords: Asthma, SF-36 quality of life scale, Beck anxiety scale

INTRODUCTION

Asthma, characterized by recurrent airway obstruction, is one of the most common chronic respiratory diseases. It affects millions of people around the world, can occur in all age groups, affects the quality of life of patients, and is therefore a global public health problem.¹

Nowadays, the main goal of asthma treatment is to control asthma symptoms and improve the quality of life of asthma patients. In monitoring asthma patients, history, physical examination, asthma control test (ACT) and pulmonary function tests (PFT) are performed. In practice, ACT helps us regulate treatment by determining the degree of asthma control in a short time.^{2,3}

Studies have shown that asthma symptoms negatively affect a person's quality of life and mood at the same time.

The impact of the disease on the physical, psychological, and social functions of daily living is assessed with quality-of-life surveys.^{4,5} A multidimensional assessment can be made with the medical outcomes study short form-36 health survey questionnaire (SF-36), which is a common survey used to measure quality of life in chronic patients.⁶

The Beck anxiety scale (BAS), a scale that provides

information about the patient's psychological and emotional state is commonly used in clinical assessment and research.⁷

In our study, the relationship between ACT and SF-36 and the BAS, which reflects the physical, emotional, social, and psychological dimensions of the disease, was investigated in patients treated in our outpatient clinics with a diagnosis of asthma.

METHODS

In our study, 222 patients who were diagnosed as asthma by Polyclinics of Chest Diseases in Ankara Training and Research Hospital were prospectively evaluated under written approval of themselves and Ethical Committee. The study was approved by the ethics committee of Ankara Training and Research Hospital with date/no: 10.5.2023/1291. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. Patients with chronic respiratory and other chronic systemic diseases except asthma who did not consent to participate were not included in the study. Demographic characteristics,

treatments used, and number of emergency department visits were examined. Income levels were classified as low, middle, and high income levels using 2023 data from the Turkish Institute of Statistics.

Spirometry measurements were performed according to the acceptance and repeatability criteria using Sensor Medics VMax spectra 229, Bithoven, The Netherlands.

Asthma control status was assessed with ACT, and patients' physical, psychological, and social functioning and quality of life were measured with SF-36 quality of life scale and BAS.

Asthma Control Test

ACT is a valid and reliable test. It is a questionnaire consisting of 5 main items that allow assessment of disease control itself, the extent to which asthma interferes with daily activities, the frequency of asthma symptoms during the day and night, and the need for emergency medication.⁸⁻¹⁰ In our study, ACT was administered by a physician in a face-to-face interview. According to the total score, 25 points were considered control, 20-24 points were considered partially control, and <19 points were considered uncontrolled.

SF-36 Quality of Life Scale Questionnaire

SF-36 is a self-assessment scale of patients. The SF-36 questionnaire (Medical Outcomes Survey Short Form-36) its Turkish version was translated by Fidan et al. was used to assess patients' quality of life, and The SF-36 questionnaire was given to the patients and they were asked to complete it themselves before the examination. The survey questionnaire SF-36 consists of 8 main headings and 36 questions: physical functions, physical role difficulties, pain, general health, vitality, social functions, emotional role difficulties, mental health. Separate scores are obtained for each subscale and the person's current health status is assessed. The subscale scores range from 0 to 100, with a high score indicating good health.¹¹

Beck Anxiety Scale

The BAS is a self-report scale designed to measure somatic, emotional, cognitive, and motivational components. It is a screening questionnaire commonly used in clinical practice and research that allows patients to provide information about themselves and to indicate some of the symptoms they experience when they are anxious or fearful. 0-7 scores indicates minimal anxiety, 8-15 scores indicates mild anxiety, 16-25 scores indicates moderate anxiety, and 26-63 scores indicates severe anxiety.⁷

Statistical Analysis

The study data were analyzed using IBM SPSS Version 23 for Windows (IBM Statistical Package for Social Sciences). Descriptive statistics for categorical variables were presented as numbers and percentages. The comparison of categorical variables was performed using the "Pearson Chi-Square Test" and "Fisher's Exact Test." The normality distribution of numeric variables was assessed using either the "Kolmogorov-Smirnov" or "Shapiro-Wilk" tests. Descriptive statistics for numeric variables were presented as mean ($\pm$) standart deviation for parametric variables and as median (min-max) for non-parametric variables. For the comparison of multiple groups, One-Way ANOVA and the Kruskal-Wallis

test were used for parametric and non-parametric numeric variables, respectively. The Bonferroni-Tukey correction test was applied to elucidate pairwise differences among multiple groups. Statistical significance levels were considered as $p < 0.05$ and were further interpreted as $p < 0.001$.

RESULTS

The mean age of patients participating in the study was 50.9 ± 15.3 years and 51.8% were female gender. 25.7% of the patients were smokers. 73% of the patients were married, and 23.9% were literate. In terms of income, middle level income was most frequently detected, it was 59%. According to ACT, 37.8% of patients were uncontrolled, 33.8% were partially controlled, and controlled 28.4%. It was found that 71.6% of women and 28.4% of men were admitted to the emergency department because of asthma. The distribution in terms of asthma classification: 29.8% were mild intermittent, 5% mild persistent, 35.1% moderate persistent and 40.1% severe persistent. The median follow-up time for asthma was 3 years, and irregular follow-up was observed in 60.4% of patients. Demographic, clinical characteristics, SF-36 quality of life scale and Beck anxiety scale results according to asthma severity were shown Table 1. Regarding educational status, it was found that educational level was lower in subjects with moderate and severe asthma, while educational level was higher in subjects with normal and mild asthma ($p < 0.001$). In terms of income level, it was found that the income level of individuals with normal asthma severity was higher than that of the other groups ($p < 0.001$). While non-smokers formed the majority in the group with normal and mild asthma severity, the number of smokers was higher in the group with moderate and severe asthma ($p < 0.001$). Gastroesophageal reflux was found more frequently in the group with moderate and severe asthma severity ($p < 0.001$). The rate of emergency department admissions was found to increase with increasing asthma severity ($p < 0.01$).

According to the severity of asthma (normal, mild, moderate, and severe), no statistically significant difference was found between groups in terms of FEV_1 value ($p = 0.090$). No statistically significant difference was found between ACT groups (not controlled, partially controlled, controlled) in terms of FEV_1 value ($p = 0.239$). FEV_1 was lower in women (2.4 vs. 3.5, $p < 0.001$). Characteristics of pulmonary function tests in relation to asthma control status was shown Table 2.

When comparing between ACT groups in relation to the SF-36 quality of life scale; physical function ($p < 0.001$), physical role difficulties ($p < 0.001$), emotional role difficulties ($p < 0.001$), vitality ($p < 0.001$), mental health ($p < 0.001$), social function ($p < 0.001$), pain ($p < 0.001$), and general health ($p < 0.001$). There was a difference between the groups ACT in relation to BAS ($p < 0.001$). It was observed that as asthma control decreased, SF-36 scores decreased and BAS scores increased. SF-36 quality of life scale and Beck anxiety scale results according to asthma control test were shown Table 3.

According to asthma classification (intermittent, mild persistent, moderate persistent, severe persistent), there was a difference between groups in all characteristics of SF-36 (Table 4). Looking at all the subscores of the quality of life scale SF-36, we find that the scores decrease with increasing asthma class. While the decrease in scores is evident in the moderately persistent group, the severely persistent group is the group with the lowest scores on the SF-36 quality of life scale.

Table 1. Demographic, clinical characteristics, SF-36 quality of life scale and Beck anxiety scale results according to asthma severity

	Normal (n=58)	Mild (n=74)	Moderate (n=55)	Severe (n=35)	p
Age, years	48.3±16.6	47.2±14.9	54.5±11.3	57.6±16.4	0.001¹
Gender, M/F (%M)	21/37 (36.2%) ^a	53/21 (71.6%) ^b	26/29 (47.3%) ^a	15/20 (42.9%) ^a	<0.001²
Marital Status					0.024²
•Single	9 (15.5%)	11 (14.9%)	2 (3.6%)	2 (5.7%)	
•Married	45 (77.6%)	47 (63.5%)	46 (83.6%)	24 (68.6%)	
•Widowed	4 (6.9%)	16 (21.6%)	7 (12.7%)	9 (25.7%)	
Education Level					<0.001²
•Illiterate	4 (6.9%) ^a	9 (12.2%) ^{a,b}	18 (32.7%) ^c	11 (31.4%) ^c	
•Literate	6 (10.3%) ^a	23 (31.1%) ^b	17 (30.9%) ^b	7 (20%) ^b	
•Primary school	9 (15.3%) ^a	11 (14.9%) ^a	10 (18.2%) ^a	13 (37.1%) ^a	
•Middle school	7 (12.1%) ^a	16 (21.6%) ^a	5 (9.1%) ^a	1 (2.9%) ^a	
•High school	16 (27.6%) ^a	12 (16.2%) ^b	4 (7.3%) ^b	3 (8.6%) ^b	
•University	16 (27.6%) ^a	3 (4.1%) ^b	1 (1.8%) ^b	0 (0%) ^b	
Income Level					<0.001²
•Low	4 (6.9%) ^a	10 (13.5%) ^{a,b}	25 (45.5%) ^c	10 (28.6%) ^{b,c}	
•Middle	22 (37.9%) ^a	57 (77%) ^b	29 (52.7%) ^{a,c}	25 (71.4%) ^{b,c}	
•High	32 (55.2%) ^a	7 (9.5%) ^b	1 (1.8%) ^b	0 (0%) ^b	
Pulmonary Function Test					
•FEV1	3.2±0.9	2.9±0.8	2.8±0.6	2.9±0.9	0.090 ¹
•FEV1/FVC	0.79±0.03	0.79±0.03	0.78±0.02	0.77±0.03	<0.001¹
Asthma Control Status					<0.001²
•Uncontrolled	0 (0%) ^a	6 (8.1%) ^a	43 (78.2%) ^b	35 (100%) ^c	
•Partial control	9 (15.5%) ^{a,b}	54 (73%) ^c	12 (21.8%) ^b	0 (0%) ^a	
•Total control	49 (84.5%) ^a	14 (18.9%) ^b	0 (0%) ^c	0 (0%) ^c	
Asthma Follow-up Duration, years	1.5 (1-6)	3 (1-6)	4 (1-8)	4 (1-6)	<0.001³
Smoking Status:					0.001²
•Non-smoker	50 (86.2%) ^a	60 (81.1%) ^a	21 (38.2%) ^b	12 (34.3%) ^b	
•Smoker	6 (10.3%) ^a	13 (17.6%) ^a	22 (40%) ^b	16 (45.7%) ^b	
•Former smoker	2 (3.4%) ^{a,b}	1 (1.4%) ^b	12 (21.8%) ^c	7 (20%) ^{a,c}	
Reflux, yes/no (yes%)	30/28 (51.7%) ^a	41/33 (55.4%) ^{a,b}	42/13 (76.4%) ^b	27/8 (77.1%) ^b	0.007 ²
Hospitalization due to asthma, yes/no (yes%)	0/58 (0%) ^a	1/73 (1.4%) ^a	29/26 (52.7%) ^b	33/2 (94.3%) ^c	0.001²
SF 36 Features					
•Physical function	100 (0-100)	70 (35-100)	50 (0-85)	0 (0-50)	<0.001³
•Physical role difficulty	100 (0-100)	100 (0-100)	0 (0-0)	0 (0-0)	<0.001³
•Emotional role difficulty	100 (0-100)	100 (0-100)	0 (0-100)	0 (0-0)	<0.001³
•Vitality	100 (0-100)	62.5 (20-90)	45 (0-70)	10 (0-50)	<0.001³
•Mental health	96 (0-100)	64 (20-88)	48 (8-72)	20 (0-56)	<0.001³
•Social function	100 (0-100)	75 (50-100)	50 (25-62.5)	0 (0-50)	<0.001³
•Pain	100 (0-100)	77.5 (65-100)	55 (42.5-65)	0 (0-55)	<0.001³
•General health	95 (0-100)	65 (30-90)	35 (5-75)	0 (0-35)	<0.001³
Beck Anxiety Scale					0.001²
•Normal	55 (94.8%) ^a	57 (77%) ^b	1 (1.8%) ^c	0 (0%) ^c	
•Light	1 (1.7%) ^a	9 (12.2%) ^{a,b}	9 (16.4%) ^b	0 (0%) ^{a,b}	
•Middle	1 (1.7%) ^a	8 (10.8%) ^a	16 (29.1%) ^b	3 (8.6%) ^{a,b}	
•Severe	1 (1.7%) ^a	0 (0%) ^a	29 (52.7%) ^b	32 (91.4%) ^c	

¹One Way ANOVA ²Pearson Chi-Square test ³Kruskal Wallis test The upper character, which is different from the upper characters in the other column, shows the difference between the groups according to the row.

Table 2. Characteristics of pulmonary function tests in relation to asthma control status

	Not controlled (n=84)	Partially controlled (n=75)	Controlled (n=63)	p
FEV1	2.85±0.8	2.9±0.8	3.1±0.9	0.239 ¹
FEV1/FVC	0.78 (0.72-0.84)	0.79 (0.74-0.94)	0.8 (0.72-0.94)	0.001 ²

¹One-Way ANOVA ²Kruskal Wallis test

Gastroesophageal reflux (GER) was found in 63.1% of patients and was similarly frequent in both genders. When the SF-36 characteristics were assessed according to the presence of GER; while there was no difference between the groups in physical function, mental health and pain (p=0.146, p=0.062 and p=0.057, respectively), physical role difficulties, emotional role difficulties, vitality, social function and general health (p=0.001, p=0.002, p=0.042, p=0.003, p=0.011). It was found that SF-36 values were lower in GER group.

Table 3. SF-36 Quality of life scale and Beck anxiety scale results according to asthma control test

	Not controlled (n=84)	Partially controlled (n=75)	Controlled (n=63)	p
SF 36 Features				
•Physical function	47.5 (0-85)	75 (30-100)	100 (0-100)	<0.001¹
•Physical role difficulty	0 (0-100)	100 (0-100)	100 (0-100)	<0.001¹
•Emotional role difficulty	0 (0-100)	100 (0-100)	100 (0-100)	<0.001¹
•Vitality	20 (0-70)	60 (20-100)	90 (0-100)	<0.001¹
•Mental health	28 (0-72)	64 (20-100)	88 (0-100)	<0.001¹
•Social function	50 (0-75)	75 (50-100)	100 (0-100)	<0.001¹
•Pain	55 (0-77.5)	77.5 (42.5-100)	100 (0-100)	<0.001¹
•General health	25 (0-70)	65 (25-100)	95 (0-100)	<0.001¹
Beck anxiety scale				
•Normal	5 (6%) ^a	49 (65.3%) ^b	59 (93.7%) ^c	
•Light	8 (9.5%) ^a	9 (12%) ^a	2 (3.2%) ^a	
•Middle	17 (20.2%) ^a	10 (13.3%) ^a	1 (1.6%) ^b	<0.001²
•Severe	54 (64.3%) ^a	7 (9.3%) ^b	1 (1.6%) ^b	

¹Kruskal Wallis test ²Pearson Chi-square test The upper character, which is different from the upper characters in the other column, shows the difference between the groups according to the row.

Table 4. SF-36 quality of life scale and Beck anxiety scale results according asthma classification

	Intermittent (n=44)	Mild persistent (n=11)	Moderate persistent (n=78)	Severe persistent (n=89)	p
SF 36 Features					
Physical function	100 (0-100)	95 (85-100)	73 (0-100)	50 (0-85)	<0.001 ¹
Physical role difficulty	100 (0-100)	100 (50-100)	100 (0-100)	0 (0-100)	<0.001 ¹
Emotional role difficulty	100 (0-100)	100 (67-100)	100 (0-100)	0 (0-100)	<0.001 ¹
Vitality	100 (0-100)	80 (50-100)	63 (15-95)	35 (0-70)	<0.001 ¹
Mental health	100 (0-100)	80 (48-100)	64 (20-88)	36 (0-72)	<0.001 ¹
Social function	100 (0-100)	100 (75-100)	75 (0-100)	50 (0-63)	<0.001 ¹
Pain	100 (0-100)	100 (100-100)	78 (0-100)	55 (0-65)	<0.001 ¹
General health	95 (0-100)	95 (75-100)	65 (0-90)	25 (0-75)	<0.001 ¹
Beck anxiety scale					
Normal	42 (95.5%) ^a	11 (100%) ^{a,b}	59 (75.6%) ^b	1 (1.1%) ^c	<0.001 ²
Light	0 (0%) ^a	0 (0%) ^a	10 (12.8%) ^a	9 (10.1%) ^a	
Middle	1 (2.3%) ^a	0 (0%) ^{a,b}	8 (10.3%) ^{a,b}	19 (21.3%) ^b	
Severe	1 (2.3%) ^a	0 (0%) ^a	1 (1.3%) ^a	60 (67.4%) ^b	

¹Kruskal Wallis test ²Pearson Chi-square test

DISCUSSION

In our study, patients with severe persistent asthma formed the majority (40.1%). It has been reported that the quality of life of asthma patients may deteriorate significantly when symptoms are severe.^{4,12,13}

Studies have reported that the majority of asthma patients were under “partially controlled”.¹³ In our study, 33.8% of patients were found to be under partially controlled.

In our study, a close relationship was found between ACT and SF-36 and BAS, whereas no relationship was found between ACT and FEV₁. In the study conducted by Bozkurt et al, no significant relationship was found between ACT and PFT. Other studies show that ACT is closely related to patients' quality of life and mood as well as asthma control.¹² ACT is a practical and reliable questionnaire to determine the degree of asthma control. GINA emphasizes that symptom control should be given at least as much importance as respiratory function testing in asthmatics.^{1,10,13-16} In our study, PFT, ACT, SF-36, and the Beck anxiety scale were used in our patients and their relationships with each other were investigated. The fact that in our study, BAS scores were higher and SF-36 scores were lower for quality of life in uncontrolled patients according to ACT results suggests that asthma patients should also be assessed for mood and treated in this regard.^{6,17,18}

Trzcinka et al.¹⁷ also mentioned inadequate asthma control in patients with low Beck anxiety scale. Janson et al.¹⁹ found no evidence that patients with diagnosed asthma suffer more frequently from anxiety and depression than patients without asthma.

GER is often associated with asthma and leads to worsening of asthma control. It is important to question GER in asthma patients. Asthma control is facilitated by treating reflux, which greatly affects quality of life. Similar to the study by Bozbaş et al. we found that SF-36 values were lower in patients with GER in our study.^{4,13}

In our study, the SF-36 scale scores decreased and BAS increased in patients admitted to the emergency department. Osman et al.²⁰ have shown that the quality of life of asthma patients deteriorates even when their symptoms are mild. Assessment of emotional state at routine examinations should be considered as part of treatment, especially in patients with low FEV₁ scores and frequent visits to the emergency department, as this affects quality of life.

Study Limitations

Although the study was prospective, it was not possible to show the change in quality of life and BAS as a result of changes in the treatment process of the patients because it was cross-sectional. The results of this study may not be representative of the entire asthma population because of the relatively small number of patients.

CONCLUSION

ACT should be used for asthma diagnosis because it is simple and easy to apply in the clinic. A strong correlation between ACT and quality of life and mood was found. In patients diagnosed with asthma, efforts should be made to improve quality of life by assessing the patient's psychological and physical functioning in addition to medical therapies.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Ankara Training and Research Hospital Clinical Research Ethics Committee. (Date: 10.5.2023, Decision No: 1291).

Informed Consent: All patients signed and free and informed consent form.

Reviewer Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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